



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,991	03/24/2004	Vijay Tewari	42P17568	.6772
59796	7590	07/11/2007	EXAMINER	
INTEL CORPORATION c/o INTELLEVATE, LLC P.O. BOX 52050 MINNEAPOLIS, MN 55402			FERRIS III, FRED O	
			ART UNIT	PAPER NUMBER
			2128	
			MAIL DATE	DELIVERY MODE
			07/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/808,991		PAUL A. MENDONSA	
	Examiner		Art Unit	
	Anshul Mangal		2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/24/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The claims in the present application were thoroughly considered and reviewed. However, they were rejected under 35 USC § 102(b) as being anticipated by prior references. Claims 1, 2, 3, 4, 5, 6, 9, 10, 11, 12, 13, 14 are rejected under 35 USC § 102(b) as anticipated by the U.S. Patent No. 6961941 granted to Nelson, et al. Claims 1, 7, and 8 are rejected under 35 USC § 102(b) as anticipated by the U.S. Patent No. 6496847 granted to Bugnion, et al. Claim 23 is similar to claim 14. Therefore, it is rejected for the same reasons as claims 14. Claims 24, 25, 26, 27, 28, 29, 30, 31, 32, 33 are similar to claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 respectively. Therefore, they are rejected for the same reasons as claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Claims 34 and 35 are similar to claims 1 and 11 respectively. Therefore, they are rejected for the same reasons as claim 1 and 11. Claims 36, 37, 38, 39, 40 are apparatus claims of 1, 2, 3, 9, 10 respectively. Therefore, they are rejected for the same reasons as claims 1, 2, 3, 9, 10.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. ***Claims 1- 6, 9-29, and 32-40 are rejected under 35 USC § 102(b) as anticipated by the U.S. Patent No. 6961941 granted to Nelson, et al.***

Nelson anticipates the limitations of the instant invention as presently claimed as follows:

Per claim 1: A method comprising: configuring a device virtual machine (VM) to emulate a hardware device (column 1 lines 27-28, Fig. 1 [200]), wherein the device VM includes device emulation code used to emulate the hardware device (column 1 lines 34-37).

Per claim 2: The method of claim 1, wherein the device VM is created dynamically. (column 3 lines 51; functionally equivalent). Nelson mentions scheduling of VMs which is functionally equivalent to a VMs being created dynamically.

Per claim 3: The method of claim 2, wherein the device VM is created dynamically by a virtual machine monitor (VMM) (column 1 lines 56-60, Fig. 1 [300]) in response to a request for a device needed to provision a new client VM being created.

Per claim 4: The method of claim 1, wherein a virtual machine monitor (VMM) uses the device VM as the emulated hardware device. (column 1 lines 52-55, Fig. 1)

Per claim 5: The method of claim 1, wherein a virtual machine monitor (VMM) allocates the device VM to a client VM. (column 1 lines 57-62)

Per claim 6: The method of claim 1, wherein a client virtual machine (VM) uses the device VM as the emulated hardware device. (column 7 lines 3-7, Fig. 1)

Per claim 9: The method of claim 1, wherein the device VM is used to emulate one or more homogeneous hardware devices. (column 1 lines 27-33; functionally equivalent)

Per claim 10: The method of claim 1, wherein the device VM is used to emulate one or more heterogeneous hardware devices. (column 1 lines 27-33; functionally equivalent)

Art Unit: 2128

Per claim 11: The method of claim 1, wherein configuring the device VM to emulate the hardware device comprises: determining which resources are needed to emulate the hardware device (column 1 line 66); if the determined resources include a hardware resource, sending a request to a virtual machine monitor (VMM) to allocate the hardware resource for the device VM (column 1 lines 64-67); and configuring the allocated hardware resource to run the device emulation code.

Per claim 12: The method of claim 11, wherein the device VM and the VMM communicate via shared memory. (column 1 lines 27-28, Fig. 1 [200]),

Per claim 13: The method of claim 11, wherein the device VM and a client VM communicate via shared memory. (column 1 lines 27-28, Fig. 1 [200]),

Per claim 14: The method of claim 11, wherein the device VM and a client VM communicate via message passing. This claim is rejected as being necessarily inherent in the prior art. Clearly, Nelson discloses message passing in Figure 1. Furthermore, message passing is shown in Nelson by setting flags (column 11 lines 10-25).

Per claim 15: The method of claim 11, wherein the hardware resource is an allocated processor execution thread. This claim is rejected as being necessarily inherent in the prior art. (column 4 line 14).

Per claim 16: The method of claim 11, wherein the hardware resource is an allocated processor core. This claim is rejected as being necessarily inherent in the prior art. (Fig. 1 [100] discloses hardware resources)

Per claim 17: The method of claim 11, wherein the hardware resource is an allocated processor. This claim is rejected as being necessarily inherent in the prior art. (Fig. 1 [100] discloses hardware resources)

Per claim 18: The method of claim 17, wherein the processor is one of a logical processor, a processor core and a stand-alone processor. (Fig. 1 [100] discloses hardware resources)

Per claim 19: The method of claim 11, wherein the hardware resource is emulated using special purpose microcode. (column 7 line 9)

Per claim 20: The method of claim 11, wherein the hardware resource is emulated using firmware. (column 7 line 9; drivers e.g. firmware)

Per claim 21: The method of claim 11, wherein the hardware resource is a special-purpose instruction set extension. (column 7 line 9)

Per claim 22: The method of claim 11, wherein the hardware resource is emulated using a reconfigurable hardware block. (column 7 line 20; a network device is functionally equivalent to a reconfigurable hardware block)

3. Claim 23 is similar to claim 14. Therefore, it is rejected for the same reasons as claims 14.

4. Claims 24, 25, 26, 27, 28, 29, 32, 33 are similar to claims 1, 2, 3, 4, 5, 6, 9, 10 respectively. Therefore, they are rejected for the same reasons as claims 1, 2, 3, 4, 5, 6, 9, 10.

5. Claims 34 and 35 are similar to claims 1 and 11 respectively. Therefore, they are rejected for the same reasons as claim 1 and 11.

6. Claims 36, 37, 38, 39, 40 are apparatus claims of 1, 2, 3, 9, 10 respectively. Therefore, they are rejected for the same reasons as claims 1, 2, 3, 9, 10.

7. Claims 1, 7, 8, 30, and 31 are rejected under 35 USC § 102(b) as anticipated by the U.S. Patent No. 6496847 granted to Bugnion, et al.

Bugnion anticipates the limitations of the instant invention as presently claimed as follows:

Per claim 1: A method comprising: configuring a device virtual machine (VM) to emulate a hardware device (column 7, lines 13-15) wherein the device VM includes device emulation code used to emulate the hardware device (column 7, lines 13-15). Nelson mentions device emulator which is functionally equivalent to device virtual machine.\

Per claim 7: The method of claim 1, wherein a virtual machine monitor (VMM) allocates the device VM to an operating system (OS) hosting the VMM. (column 7, lines 13-17; Fig. 3; functionally equivalent)

Per claim 8: The method of claim 1, wherein an operating system (OS) hosting a virtual machine monitor (VMM) uses the device VM to emulate the hardware device. (column 7, lines 17-21; Fig. 3; functionally equivalent)

8. **Claims 30 and 31 are similar to claims 7 and 8 respectively. Therefore, they are rejected for the same reasons as claims 7 and 8.**

Drawings

9. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

MPEP Section 608.02(d) [R-2] "Complete Illustration in Drawings" recites the following:

"37 CFR 1.83. Content of drawing.

(a) The drawing in a nonprovisional application must show **every feature** of the invention **specified in the claims**. However, conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation"

In this case, none of the drawings (Figs. 1-3) show a **logical processor**, a **processor core**, and a **stand-alone processor** as recited in dependent claim 18.

Art Unit: 2128


Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anshul Mangal whose telephone number is 571-272-6022. The examiner can normally be reached on 8:30-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anshul Mangal, Primary Examiner
Simulation and Emulation, Art Unit 2128
U.S. Patent and Trademark Office
Randolph Building, Room 5D19
401 Dulany Street
Alexandria, VA 22313
Phone: (571-272-6022)
Anshul.Mangal@uspto.gov
July 5, 2007


FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100